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ABSTRACT

This study investigated the predictors of school mobility and the influence of mobility on grade 6 math and reading achievement. The sample included 988 urban, low-economic status black children participating in a longitudinal study of the effects of preschool intervention. Fifty-eight percent of the students changed schools at least once. Preschool intervention did not predict mobility. Only free lunch eligibility significantly predicted mobility. Although the number of moves significantly predicted mobility, frequent mobility had a stronger relationship with grade 6 reading achievement after controlling for family background and kindergarten achievement. The results suggest that schools should pay particular attention to high mobility students through varied intervention programs. (Contains 41 references.) (Author/MDM)

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# The Effects of School Mobility on Scholastic Achievement

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Running Head: SCHOOL MOBILITY

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# The Effects of School Mobility on Scholastic Achievement

## Abstract

This study investigated the predictors of school mobility and the influence of mobility on Grade 6 math and reading achievement. The sample included 988 urban, low-economic status, black children participating in a longitudinal study of the effects of preschool intervention. 58% changed schools at least once. Preschool intervention did not predict mobility. Only lunch eligibility ($\underline{b}$ = -.15) significantly predicted mobility. Although the number of moves ($\underline{b}$ = -.07) significantly predicted mobility, frequent mobility ($\underline{b}$ = -.29) had a stronger relationship with Grade 6 reading achievement after controlling for family background and kindergarten achievement. These results suggest that school should pay particular attention to high mobility students through varied intervention programs.

## Introduction

An estimated six million elementary school-aged children change schools each year (Cornille, Boyer, & Smyth, 1983). Those transfers could be normative or non-normative. Transfers prescribed by the school system are normative while transfers initiated by child and family factors are non-normative. School mobility after a residential move is an example of a non-normative move. American children have one of the highest residential mobility rates when compared to several Western countries and Japan (Long, 1992).

The extent to which normative and non-normative school moves affect children has been studied for a long time. Leonard and Elias (1993) indicated that mobile students are prone to developmental problems such as low academic achievement. Mobile students were also found to have behavioral problems, to be retained in school (Kantor, 1965; Reynolds, 1994; U.S. General Accounting Office, 1994; Wood, Halfon, Scarlata, Newacheck, & Nessim, 1993), and to be suspended or expelled (Simpson & Fowler, 1994). The most vulnerable appear to be low-income,

low-achievers who have undergone stressful events at home and/or at school (Danner, Jason, & Kurasaki, 1993; Wood et al., 1993).

Preschool intervention programs are aimed at enhancing children's social competence (U.S. Department of Health and Human Services, 1993) so that adjustment to life stressors, such as mobility, becomes easier. However, the impact of preschool intervention on easing mobility effects haven't been well documented (Reynolds & Bezruczko, 1993). This study addressed three questions: (1) What is the frequency of school mobility from kindergarten through fifth grade among low-income children? (2) What are the predictors of school mobility? (3) Is school mobility associated with children's achievement in Grade 6 above and beyond family and child background factors?

## Research Context

In order to understand the scope of the problem, some information regarding the frequency of mobility will be provided along with a review of literature on the correlates and effects of mobility.

### Frequency of School Mobility

A General Accounting Office report (1994) used a sample of elementary school children stratified by census region and three levels of urbanization. The frequency of mobility until third grade was reported as follows: approximately 17 percent have attended three or more schools since first grade -one in six children or more than a half-million children- have attended at least three schools since the beginning of first grade; 24 percent have attended two schools; and the remaining 59 percent did not change schools since first grade.

When third graders in the inner city were examined separately, it was found that one-fourth have changed schools three or more times compared to one-seventh of children from rural or suburban areas or from small cities or towns. During the school year, 11 percent changed schools once and 2 percent changed schools twice. The change occurred within and/or across districts. Finally, when the relation between income and mobility was examined, it was found that 30 percent of third graders from low-income families (earnings below $10,000 per year) have changed three or more schools compared with 8 percent of children in families with incomes of $50,000 or more. Fewer children changed schools frequently as the family income increased.

As for school mobility beyond the elementary school, approximately 3.2 million youngsters made the transition from elementary to middle or junior high school in the public school system in 1990 (U.S. Department of Education, 1992). The proportion of mobile students decreased with higher grade levels (Ingersoll, Scamman, & Eckerling, 1989).

Correlates and Effects of Mobility

Studies on the relationship between mobility and school competence resulted in inconsistent findings. Studies of military families showed favorable and non significant but not negative effects of mobility. Greene and Daughtry (1961) controlled for three measures of school mobility: number of non normative moves from Grade 1 to 11, recency of move and distance of move. They found favorable effects of mobility on academic achievement and on school adjustment. Cramer and Dorsey (1970) found 366 sixth-grade children of enlisted Air Force personnel to have higher reading proficiency with higher mobility but the results were not significant at the .05 level. Similarly, Marchant and Medway (1987) found that the relationship

between school achievement and mobility among the children of forty Army families was in the positive direction but not significantly different than zero at the .05 level.

Conversely, studies that targeted inner city children almost invariably found negative results. Levine, Wesolowski and Corbett (1966) studied 574 inner city elementary school and found that in both lower and upper grades, the number of moves is associated with a lack of good grades. While students with an A average have not attended more than two schools, 38 percent of students with a D or F average did. They also found a stronger relationship between grades and the number of moves for girls, although overall the girls had higher grades than the boys.

More controlled studies show more complex effects of mobility. Studies that controlled for SES, IQ or prior achievement revealed more variations in achievement. Morris, Pestaner and Nelson (1967) used anticipated achievement values in math and reading of 410 fifth graders in the industrial suburbs of northern Alameda County, California. They subtracted expected scores on the basis of intelligence and actual raw scores to derive the values. They found children who moved two or three times clustering in the top and the bottom third. The low SES children occupied mainly the bottom third. The result was found in reading but not in mathematics achievement.

Similarly, Whalen and Fried (1973) found differences in the achievement-mobility relationship by IQ among 874 eleventh grade California students in a suburban setting. Highly intelligent students who moved 4 or more times had higher achievement scores than highly intelligent students who moved fewer times. Less mobile students with low intelligence scored higher than high mobile students with low intelligence. However, in comparison to the Morris,

Pestaner and Nelson study, Whalen and Fried investigated SES and found the relationship between SES and mobility to be non significant at the .05 level.

Benson, Haycraft, Steyaert and Weigel (1979) reported that mobility is negatively correlated to achievement ($r = -.16$), adjustment ($r = -.15$) and SES with the lower SES child being the more mobile. They studied 1,007 sixth-grade students in 17 elementary schools in Colorado. The findings were replicated in the GAO report (1994). 41 percent and 33 percent of frequently mobile children were below grade level in reading and in mathematics respectively. Poor children have the lowest achievement scores regardless of the frequency of moves. Blane, Pilling and Fogelman (1985) using a longitudinal study in Great Britain of children's mobility found that the differences existed prior to mobility.

Parent education and grade level interacted with geographic and consequently school mobility in predicting achievement. Children whose fathers did not finish high school degree were three times as likely to be below the modal grade level than children whose fathers completed a college degree (Long, 1975). Straits (1987) found negative effects of mobility to be a function of the region and type of place for teenagers with parents having less than eight years of schooling.

As for grade level, Ingersoll, Scamman and Eckerling (1989) reported a negative impact of geographic mobility on student achievement throughout all grade levels. However, the effects were most prominent in the earlier grades. In most grade levels, the effect was stronger in math than in reading.

Overall, studies that examined only middle-class or high SES groups rarely found negative effects of mobility. On the contrary, studies that targeted low SES children found negative

effects. However, studies that failed to control for SES, family background and prior achievement failed to find existing effects or found confounded results in need of replication.

Very few studies investigated the longitudinal effects of mobility in an intervention program that targeted low SES children. In an investigation of longitudinal effects of preschool intervention, it was found that despite preschool intervention, changing schools after kindergarten had a negative impact on Grade 1 (Reynolds, 1991) and later on Grade 3 achievement (Reynolds, 1992). However, school mobility regression coefficients were negative but not significant in predicting Grade 4 reading achievement, teacher ratings, and perceived competence (Reynolds & Bezruczko, 1993). This study extends the previous studies by testing the effects of mobility with a comprehensive model.

The present study addressed the following questions: (1) What is the frequency of school mobility from kindergarten through fifth grade among low-income children? (2) What are the predictors of school mobility? (3) Is school mobility associated with children's achievement in Grade 6 net of family and child background factors?

## Methods

### Sample

The present study included 988 black children, of whom 708 enrolled in the Elementary and Secondary Education Act (ESEA) Chapter I funded Child Parent Center (CPC) Preschool Program for either one or two years. The Hispanic children (5% of the sample) were excluded from the study to obtain a ethnically homogeneous sample. The other 280 children entered kindergarten with no preschool experience.

The sample consisted of children participating in The Longitudinal Study of Children at Risk, an ongoing study investigating the educational adjustment of disadvantaged, minority children (Reynolds & Bezruczko, 1993). The original sample was composed of 1,539 low-income, minority children (95% black, 5% Hispanic) who attended government-funded kindergarten programs, in 26 Chicago Public Schools in 1986. At grade 6, 1,245 (81%) children were still enrolled in the Chicago Public Schools. The sample was comparable to the original sample on preschool participation, sex, and kindergarten reading achievement. The composition of the original, Grade 6 and study samples is presented in Table 1.

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Insert Table 1 about here

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Predictor Variables

School mobility will be used as an outcome in the first part of the analysis and as a predictor of Grade 6 math and reading achievement in the second part of the analysis.

Prekindergarten experience. Students with no preschool experience from fall 1983 to spring 1985 were coded 0. Students with preschool experience were coded 1. The information was retrieved from computerized student records.

Gender. Gender was obtained from centralized school records (0 = boys, 1 = girls).

Parent education. Information was based on parent survey questionnaire responses or telephone interviews in students' second, fourth or sixth year (1990-1992). Parent education variable was coded 0 or 1 (1 = high school graduate or beyond, 0 = nongraduate).

A missing-data indicator. A missing-data indicator on parent education was included to examine whether people who responded were different from people who didn't (1 = missing, 0 = not missing).

Lunch subsidy. Information was based on parent survey questionnaire responses or telephone interviews in students' fourth or sixth year (1990-1992). The lunch subsidy variable ranged from 1 to 3 with 1 = full subsidy, 2 = partial subsidy, 3 = no subsidy.

Kindergarten reading and mathematics-total subtest scores. Two subtests, the reading comprehension and mathematics total on the Iowa Test of Basic Skills (ITBS, Level 5, Form 7) were used as a measure of school readiness (Hieronymus, Lindquist, & Hoover, 1980a). The test was administered in the spring of 1986 under standardized procedures. The reading subtest consists of 35 items on word analysis. The mathematics subtest consists of 33 items. Reported internal consistency reliability estimates were .87 for reading and .82 for mathematics (Hieronymus, Lindquist, & Hoover, 1980b). The measure has predictive validity for later achievement (Reynolds, 1989). Scores were converted into grade equivalents. Grade equivalents are developmental scores that correspond to school year units.

Outcome Variables

School Mobility. This variable is defined as the number of times children moved between kindergarten and prior to Grade 6. The measure is collected once per year around the mid-year and thus is a conservative indicator of the number of school moves. Six moves is the maximum number to be expected. The data were extracted from centralized school records. The children had to stay in the Chicago Public Schools to remain in the study.

Reading comprehension and mathematics-total subtest scores. The ITBS (Form H, Level 11 or 12) was administered in the spring of 1992. The reading subtest includes 49 items on proficiency in understanding text passages. The mathematics subtest includes 95 items on computation, concepts, and problem solving. The test has high reliability and predictive validity. Internal consistency reliability estimates are .93 and .95 for reading and mathematics (Hieronymus & Hoover, 1990). Scores were converted into grade equivalents.

Data Analysis

Regression analysis was the primary analytic technique. In the first step hierarchical multiple regression was employed to estimate the predictors of mobility. Predictors were sex, lunch subsidy, parent education, preschool enrollment and kindergarten math and reading achievement.

In the second step, hierarchical multiple regression was employed to estimate the impact of school mobility on children's reading and math achievement in Grade 6. Besides mobility at Grade 5, child, family attributes (preschool enrollment, sex, lunch eligibility and parent education) and kindergarten math and reading achievement were included in the analysis as covariates because they represented plausible confounding variables.

## Results

The results section includes three parts: descriptive measures, predictors of mobility and predictors of achievement.

Descriptive Findings

As presented in Figure 1, the percentage distribution of the number of moves was as

follows: no move, 41.6 percent (N=411); one move, 29.7 percent (N=293); two moves, 16.5 percent (N=163); three moves, 8.0 percent (N=79); and four or more moves, 4.2 percent (N=42).

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Insert Figure 1 about here

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Anova tests indicated that lunch eligibility, parent education and the missing-data indicator on parent education interacted with mobility. Sex and preschool enrollment were non- significant at the .05 level.

The Grade 6 math and reading mean grade equivalents (GE) for reading and math achievement by mobility groups are indicated in Figure 2. The means among the mobility groups were significantly different from each other at the .05 level. The non-mobile group had the highest scores. The GE mean was 5.38 for reading and 5.69 for mathematics.

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Insert Figure 2 about here

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Predictors of Mobility

Multiple regression analyses indicated that the missing-data indicator (b=.20, p= .01) and lunch eligibility (b=-.15, p=.04) predicted mobility (Table 2). The regression coefficients are in metric form. Eligibility to full lunch subsidy is associated with a higher likelihood of mobility. A change from full subsidy eligibility to partial subsidy or from partial subsidy to no subsidy is associated with .15 increased frequency of mobility. In other words, poor children are more likely

to move. Moreover, children missing on the parent education variable were more likely to move than children who were not.

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Insert Table 2 about here

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Predictors of Reading and Math achievement

Mobility (b= -.07) predicted reading achievement when controlling for the other variables (Table 3). The model had a significant $R^2$ of .30. Each additional move is associated with one month decline in reading achievement. Mobility did not predict math achievement.

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Insert Table 3 about here

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Furthermore, when children were classified into high-, low-, and non-mobility groups, high mobility predicted reading achievement. Children who moved 3 or more times were three months behind in reading achievement than those who didn't (b=-.29, p=.02). The effect size was -.21 which indicated that the average child in the high mobility group had a lower score than 58% of all the children in the non-mobility group. High mobility did not predict math achievement. The effect size was -.14.

## Discussion

This study investigated the prevalence and predictors of school mobility and the influence of mobility on Grade 6 achievement. Approximately, 30 percent changed schools once and 29

percent changed schools more than once. Preschool intervention did not predict mobility. Only SES (lunch eligibility) predicted mobility. Mobility predicted Grade 6 reading and math achievement and frequent mobility predicted a three-month decline in reading scores.

The findings need to be interpreted with caution. The mobility measure is collected once per year in the spring and thus children might have moved more times than what was reported. Thus, findings may be conservative estimates of mobility effects. Also, the study tracked children who moved within the public school system in Chicago. It remains unknown whether moves to private schools or more distant moves might have impacted children differently. Moreover, this study did not investigate the influence of school SES (Audette, Algozzine, & Warden, 1993), children's developmental levels (Goebel, 1978) and gender (Orosan, Weine, Jason, & Johnson, 1992) on mobility.

However, findings were consistent with studies that examined inner-city children (Levine et al., 1966) and low-SES children (Benson et al, 1979; U.S. General Accounting Office, 1994). Results also confirmed the findings that differences existed prior to the move (Blane et al., 1985). Repeated developmental discontinuity and persistent economic hardship disrupted children's adjustment possibly even when early intervention was available.

With poverty levels increasing among minority preschool children (U.S. General Accounting Office, 1993), frequent school mobility is likely to increase, which may further exacerbate difficulties in achievement. Often, frequently mobile children are less likely to benefit from federal education programs (U.S. General Accounting Office, 1994). In this study, children who began kindergarten in 26 schools were enrolled in approximately 300 schools by Grade 5

(Reynolds & Bezruczko, 1993).

It is possible that the negative effects of mobility reflect unmeasured factors of stress such as economic hardship, marital discord or lack of social support (Reynolds, 1992). Warren-Sohlberg and Jason (1992) also found that the reason for a move related to school adjustment.

Intervention strategies and programs could target highly mobile children and mitigate the effects of poverty and mobility. Some programs have been successful in alleviating the effects of mobility. Before a move, Elias, Gara and Ubriaco (1985) found a need to enhance the children's problem solving and coping skills and to enhance the teachers' conflict resolution skills as preventive measures in a normative transition. Smardo (1987) suggested enhancing parent-school relationships so the school could be notified in case of a transfer which facilitates the forwarding of records. After a move, orientation programs for children, parents and teachers, buddy system, monitoring home programs and individualized interventions have been implemented (Blair, Marchant, & Medway, 1984; Keats, Crabbs, & Crabbs, 1981; Panagas, Holmes, Thurman, Yard, & Spaner, 1981). In the case of low-SES families forced to move because of economic hardship, Schuler (1990) showed one example of how other agencies such as the department of social services and landlords could help decrease mobility in their communities.

This study found poverty a significant predictor of mobility and frequent mobility a significant predictor of a lower reading achievement in Grade 6. There is a need for comprehensive programs that would target the needs of high-risk populations and stabilize families in a successful environment. One avenue could be intervention programs for which poor families are eligible.

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Table 1

Background Characteristics of the Original, Grade 6 and Study Samples

| Characteristic | Original sample | | Grade 6 sample | | Study sample | |
|---|---|---|---|---|---|---|
| | n | M | n | M | n | M |
| % girls | 1456 | .51 | 1238 | .52 | 988 | .52 |
| % Blacks | 1539 | .95 | 1240 | .95 | 988 | 1.00 |
| % high school graduate | 965 | .58 | 847 | .57 | 718 | .59 |
| % lunch subsidy eligibility | 992 | .93 | 847 | .93 | 718 | .93 |
| % missing on high school or lunch eligibility | 1539 | .39 | 1245 | .32 | 988 | .27 |
| % NonCPC comparison group | 1539 | .25 | 1245 | .30 | 988 | .28 |
| ITBS kindergarten reading GE scores | 1531 | 1.08 (.68) | 1242 | 1.08 (.68) | 988 | 1.11 (.68) |
| ITBS kindergarten math GE scores | 1531 | .78 (.77) | 1242 | .79 (.78) | 987 | .83 (.77) |

Note. CPC stands for children who attended the Child Parent Center Program. High school graduate= parents' educational level. Lunch subsidy= child eligible for federal lunch subsidy. ITBS = Iowa Test of Basic Skills grade-equivalent scores. Standard deviations for ITBS are in parentheses.

Table 2

Multiple Regression Analysis Predictors of Mobility in Grade 5

| Predictor | Metric coefficient | Standardized coefficient | $R^2$ |
|---|---|---|---|
| Preschool enrollment | -.06 | -.02 | .03 |
| Parent education | -.15 | -.06 | |
| Missing on parent education | .20* | .08* | |
| Sex | -.05 | -.02 | |
| Lunch eligibility | -.15* | -.06* | |
| ITBS kindergarten math GE scores | -.10 | -.07 | |
| ITBS kindergarten reading GE scores | -.05 | -.03 | |

* $p < .05$

Table 3

Hierarchical Regressions of Reading and Math Achievement on Child, Family and School Variables

| Predictor | Grade 6 reading GE | $R^2$ | Grade 6 math GE | $R^2$ |
|---|---|---|---|---|
| 1. Mobility | -.16* | .02 | -.14* | .01 |
| 2. Mobility | -.12* | .10 | -.09* | .09 |
| Sex | .52* | | .39* | |
| Preschool intervention | .24* | | .37* | |
| Lunch eligibility | .36* | | .36* | |
| Parent education | .42* | | .42* | |
| Missing variable on parent education | -.35* | | -.43* | |
| 3. Mobility | -.07* | .31 | -.04 | .31 |
| Sex | .45* | | .33* | |
| Preschool intervention | -.00 | | .11 | |
| Lunch eligibility | .24* | | .24* | |
| Missing variable on parent education | -.29* | | -.36* | |
| Parent education | .26* | | .25* | |
| ITBS kindergarten math GE scores | .39* | | .45* | |
| ITBS kindergarten reading GE scores | .65* | | .65* | |

* $p < .05$

# Figure 1
# FREQUENCY OF MOBILITY

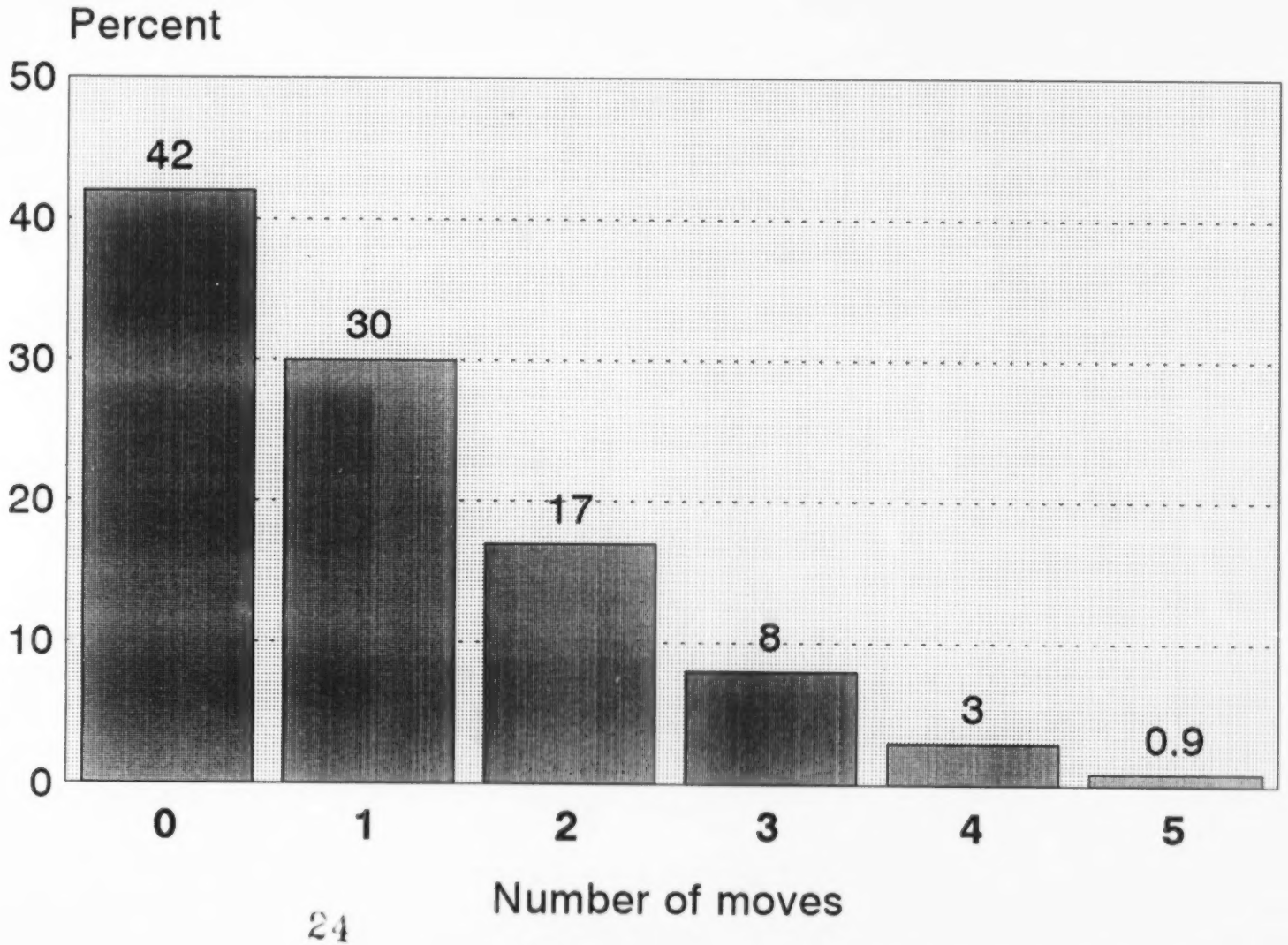

Figure 2

# MATH AND READING ACHIEVEMENT BY MOBILITY